



DEPARTMENT OF THE NAVY

NAVAL EDUCATION AND TRAINING CENTER
NEWPORT RHODE ISLAND 02841-5000

IN REPLY REFER TO:

5090

Ser 40E/149

24 Dec 96

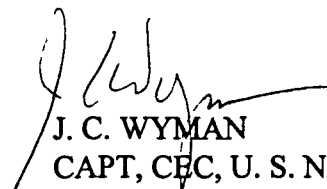
Rhode Island Department of Environmental Management
Division of Waste Management, Underground Storage Tank Section
Attn: Eric Beck
291 Promenade Street
Providence, RI 02908-5767

Dear Mr. Beck:

We are submitting an addendum to the Tank Farm 4 work plan that addresses the tank demolition procedures. The work plan was previously submitted to you on May 29, 1996. We are requesting confirmation of your concurrence with the demolition procedures and approval of the work plan.

Our point of contact for questions or additional information is Mr. Raymond Roberge at (401) 841-3735.

Sincerely,


J. C. WYMAN
CAPT, CEC, U. S. NAVY
Director for Public Works
By direction of the Commander

Copy to:
NORTHNAVFACENGCOM Lester PA (Code 1811/B. Helland)
Chief of Naval Education and Training, Pensacola, FL (Attn: Mark Spitznagel)

4.3.9 Tank Demolition

Once RIDEM has conducted a closure inspection and all documentation to verify the completion of the cleaning operation has been gathered, the tank is ready for demolition. The demolition objective is to remove the tank roof, pulverize the interior columns and remove the tank side walls to an elevation of 5 feet below existing grade, while maintaining the integrity of the tank floor and side walls. Demolition activities are as follows:

4.3.9.1 Site Preparation

The main access road entering the site will need to be widened an additional lane to allow a two-way traffic pattern. Barrow material delivery trucks will enter the site on the improved main access road then bare right onto the one-way loop roadway make their delivery and then exit the site on the improved main access road.

Barrow soil stockpile areas will be created on the inner portion of the site for temporary storage of stockpiled material. These stockpile areas will consist of a cleared area with perimeter silt fencing.

4.3.9.2 Perimeter Clearing and Excavation

The perimeter of each tank will be cleared approximately 10 feet. All cleared vegetation will be disposed off-site. This clearing will allow access to excavate a trench with 1V:1H side slopes from the perimeter existing grade to the edge of the tank roof and expose the tank roof perimeter for saw cutting. As space will allow, excavated material as well as existing overburden will be placed on top of the tanks to avoid extra handling, and this material will fall into the tanks with the demolished roof upon detonation. Soils that will not fit on the tank roof will be staged adjacent to the tank for placement as fill after detonation.

4.3.9.3 Tank Demolition Preparation

The tank roof perimeter will be exposed and pre-cut every alternate 15 feet, at a circumferential location approximately 33 inches back from the outside lip of the roof. A series of blast holes will be drilled through the roof. The first series will be on the perimeter of the tank, where the tank roof rests on the tank wall, coincident with the uncut 15 foot section, to a depth of 24 inches. Two additional series, one directly in line with the saw cut on the alternate 15 foot line and the last series completely around the perimeter of the tank, 18 inches in from the saw cut line.

Roof support columns will have a series of 1 1/2 inch holes drilled horizontally to a depth of up to 3/4 of the column diameter, at a vertical spacing of approximately 18 inches, beginning from 18 inches below the top of the sand fill and continuing up to the roof of the tank. These holes will be drilled utilizing a manlift to gain access.

Three inch diameter holes will be core drilled at this time at the high water elevation, every 40 feet on center, through the side walls of the tank. These holes will allow drainage at this elevation. These high water elevation drainage holes will be required for every tank except tank 170.39 and tank 70.40 with high water elevation levels at approximately the same elevation as the top of the tank.

All confined space protocols will be followed for this operation

A 10 foot layer of sand will be placed into the tank to absorb the shock from the collapsing tank roof and to fill voids between the tank floor and the tank roof. The sand will be transported by conveyor through one of the existing openings in the tank roof. The sand will be spread evenly in the tank using a Bulldozer which will be lowered by a crane and staged in the tank.

4.3.9.4 Pre-Blast and Seismic Monitoring

All residents within a 1000 foot radius of the demolition activities will be contacted and informed of the demolition activity and schedule. A request will be made to allow an interior inspection of residences to establish existing conditions. Photographic and video records of exterior structures, side walks, streets and curbs will be made at this time. Visual surveys will be done prior to each blast event. Seismic monitors will be set up at intervals around the blast area and at the nearest structure to the blast area to ensure a comprehensive record of conditions prior to, during and after each blast event. A post demolition inspection, with field work comparisons to pre-demolition conditions, will be conducted after all demolition is complete. A detailed seismic monitoring plan with location sketches will be provided by the blasting contractor.

4.3.9.5 Tank Demolition

The mechanical theory for imploding the tanks is to stress the center of the tank roof which will be held up for a fraction of a second (due to delayed charges) by a few supporting columns until the stress is at its greatest. Then the few remaining support columns will be eliminated at the critical moment, thus allowing the concrete roof to fall free into the tank onto the sand bedding.

An area within the site will be dedicated for the storage of the explosives. The transportation, storage and handling of explosives will be per applicable Federal, State and Local regulations. The site will have 24 hour security provided for the explosive storage area.

The blast area perimeter will be clearly defined with the access strictly controlled. Only approved personnel will be allowed access to the blast area. All approved personnel will sign an entry log in and out of the blast area to allow the blaster in charge to take a head count in the event of an emergency. A safe area will be established for personnel in the event of an emergency or evacuation.

The handling of all explosives will be supervised by the blaster in charge. All drilled holes will be checked and, if blocked, will be cleared prior to loading. The explosives will be loaded into the prepared holes, and the electric detonators will be inserted into the explosives. The

explosives will be secured by stemming, a clay material packed in the open end of the drilled hole.

Upon completion of the loading operation, wiring of the blasting series will begin. Each blasting series will be checked for continuity by use of a blasters multi-meter and electrical shunts. After all the series have been tested, the individual blasting series will be attached to the firing line.

The blaster will conduct a walk through inspection of the tank and blast area. Two hours prior to the blast, the area of the blast will be cleared of all non-essential personnel and no one will be permitted closer than the pre-determined safe viewing area. Immediately prior to the blast, the firing series will be checked to ensure continuity and resistance. They will be checked until the wiring is confirmed as ready, at which time they will be connected to the blast machine.

The blasting signals shall be given as follows:

<u>Test Signal:</u>	Ten minutes prior to the blast, one minute long siren.
<u>Warning Signal:</u>	Five minutes prior to blast, one minute long siren.
<u>Blast Signal:</u>	One minute prior to blast, ten second long siren.
<u>Count Down:</u>	10 - 1 Verbally.
<u>Fire:</u>	Detonation occurs.
<u>All Clear:</u>	Prolonged siren.

Following the all clear, the seismic data will be reviewed and a post blast inspection will be conducted of the surrounding area by the blaster in charge.

The tank roofs will be imploded in three groups of four. Each roof in each group to be imploded consecutively. The whole blast procedure from the test signal to the all clear signal is expected to take less than two hours.

Access for potable water will be set up around each tank location as a dust control measure. The blast area will be wet down prior to the blast and be available after the blast, if necessary.

4.3.9.6 Water Treatment

Water treatment operations will be maintained during demolition activities to treat ground water removed from the ring drain system, if necessary. Ground water surrounding the tank will be maintained at a level no greater than 11 feet from the tank floor level until sufficient fill material has been placed to avoid buoyancy and water infiltration into the rack.

4.3.9.7 Backfilling

The tank sites will be backfilled with a granular material. Granular material will consolidate as it is placed and, if required at a future date, can be dynamically compacted to a depth of 25 to 30 feet. Material such as bedding sand and natural (virgin) road base are suitable for proper granular backfill. The natural road base is well-graded with the largest size fraction less than 3 inches and less than 10% passing the number 200 sieve. The bedding sand is similar to a concrete sand aggregate quality, but contains on the order of 4% passing the number 200 sieve. Based on the volume of the site needs, both materials will be utilized as backfill material. Testing to confirm gradation will be performed for record purposes. Materials will be certified as clean fill.

A conveyor will be utilized to place backfill material within the tank. Backfill material will be brought up to the elevation needed to support equipment access for the tank wall demolition activity. Once wall demolition has been completed, conventional backfilling methods will be utilized to complete the backfilling process. Backfill areas will be slightly mounded above existing grade to compensate for settling. Upon completion of the backfilling process, the site will be surveyed and a survey monument will be set to identify the location of each demolished tank.

4.3.9.8 Post Demolition Soil Stability

The remediated tank sites will have the subsurface conditions recorded such that foundation support can be designed and constructed in the future for site development as necessary. Backfill will be placed without additional compaction. Should compaction later be desired, the site can be prepared subsequently by dynamic compaction, provided that granular backfill is used.

Dynamic compaction involves dropping a heavy weight (10 to 40 tons) on the ground surface from a height (50 to 100 feet) with a large crane. The weight is usually dropped 6 to 10 times at each drop point, which is part of a drop point grid (7'x7' to 25'x25') established to uniformly compact the subgrade.

Heavy structures can be supported on piling with their tips on or above the in-place concrete tank bottom. The tank bottoms are understood to be founded on bedrock. Caissons, if used, would probably have to penetrate into the tank bottom. H-piles with points could be driven to final driving resistance in fallen concrete roof debris or to top of the concrete tank bottom. "Franki" piles could be driven to capacity above the tank bottom.

Since the tank walls are generally greater than 5 feet below the existing ground surface, little additional work will be necessary to remove them. Justifications for the 5 foot depth criteria are as follows:

- Spread footings would require about 3 feet of embedment to penetrate below the frost heave zone. This provides a 2 foot foundation soil buffer between the footing bottom and the top of the wall, which should be more than sufficient to avoid point bearing.
- The 5 foot clearance criteria should provide sufficient space for utilities. Sewers in most cases are the deepest utilities because gravity drainage is required. It is assumed that since the project site is not level, sewers can take advantage of the natural site grade.
- The worst case scenario is that a wall is encountered by a footing or a utility excavation. For this condition, it would not be a great hardship to remove a small section of wall during future site development. The potential cost of removing small wall sections in the future must be compared to the cost of removing all the walls to an increased depth now.

Future development can be supported on the remediated tank sites.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

BY JFB DATE 11/20/96

CHKD. BY _____ DATE _____

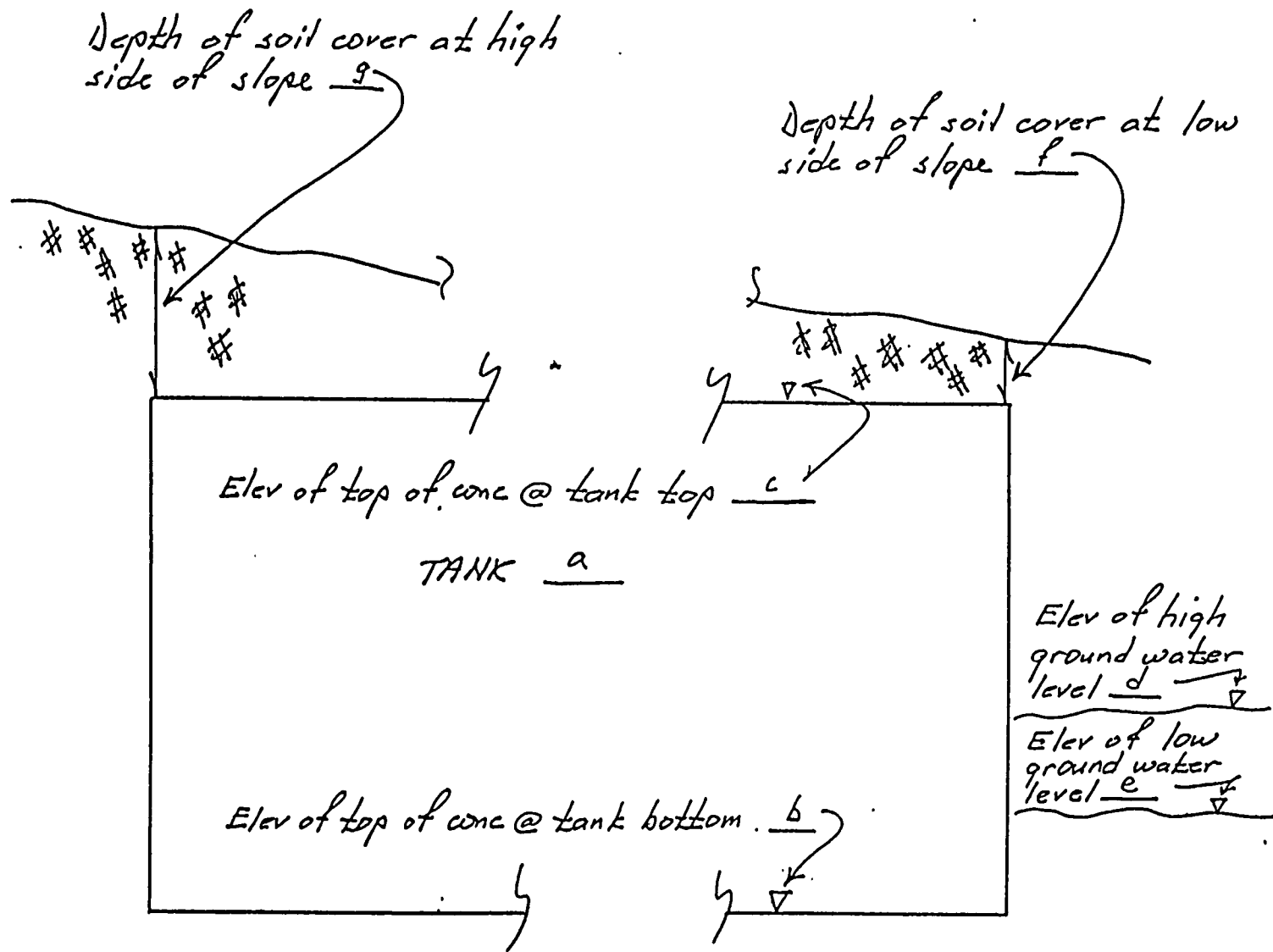
CLIENT Northdr RAC

PROJECT DO #13 Tank Farm 4

SUBJECT _____

OFS NO. _____ DEPT. NO. _____

SHEET _____ OF _____



NORTHDIV RAC						
DELIVERY ORDER #13						
TANK FARM 4						
TANK DATA						
Tank No.	Bot. Elev.	Top Elev.	Hi Wtr. El.	Lo Wtr. El.	Lo Cover	Hi Cover
a	b	c	d	e	f	g
37	50.08	86.22	68.21	66.05	2	6
38	29.56	65.14	62.41	59.56	3	9
39	20.06	55.64	55.64	52.61	5.5	7.5
40	11.87	47.45	47.2	44.39	6.5	6.5
41	8.33	43.91	24.61	22.28	5.6	7
42	53.11	88.69	71.16	70.27	8	8
43	41.89	77.47	63.05	60.75	5	5
44	21.64	57.22	53.5	47.64	8	8
45	73.04	108.62	93.63	89.82	5	5
46	67.64	103.22	85.61	83.36	2	8
47	44.54	80.12	66.14	63.87	2	6
48	25.06	60.64	55.77	51.39	4	9.5

FOSTER WHEELER ENVIRONMENTAL CORPORATION

BY JPB DATE 11/23/96

SHEET _____ OF _____

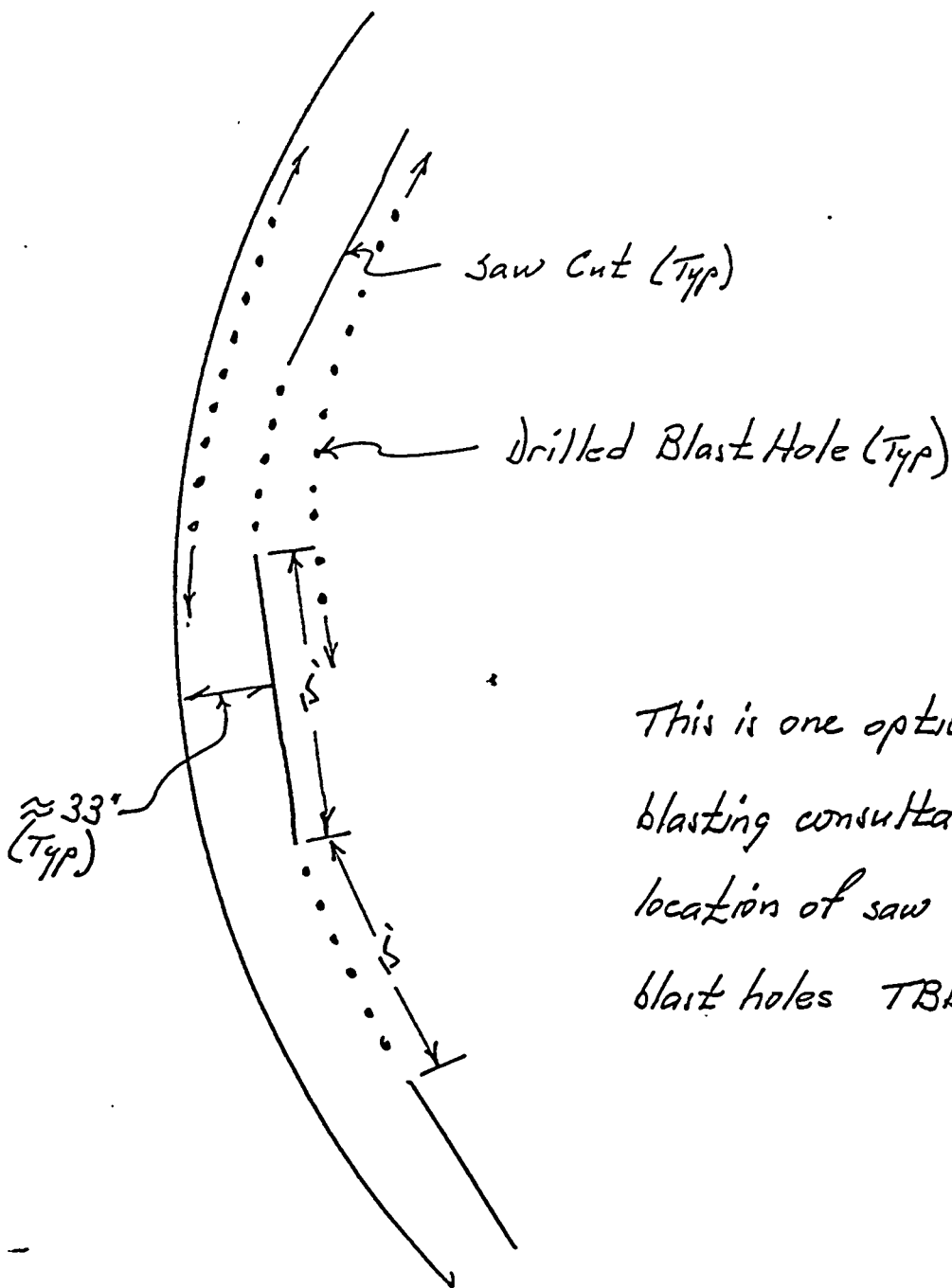
CHKD. BY _____ DATE _____

OFS NO. _____ DEPT. NO. _____

CLIENT _____

PROJECT TANK FARM 4

SUBJECT Saw cuts and blast holes in top of tank



This is one option proposed by blasting consultant. Actual location of saw cuts and blast holes TBD.

**US NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-94-D-0398**

Appendix D

Tank Demolition Subcontractor Requirements

**TANK FARM NO. 4 REMEDIAL ACTIONS
NAVAL EDUCATION AND TRAINING CENTER (NETC)
NEWPORT, RHODE ISLAND**

***DECEMBER 1996**

APPENDIX D

1.0 Tank Demolition Subcontractor Requirements

The purpose of this appendix is to outline the tank demolition subcontractor requirements. The information outlined is to be submitted by the subcontractor to FWENC for review and approval prior to forwarding it to the NAVY for final approval.

1.1 Pre-qualifications of all personnel involved

- Resumes and corporate experience shall be submitted for approval prior to award.
- All personnel shall have 10 years in explosive demolition and subsurface demolition on at least one project of similar magnitude.
- Provide all local, state, federal blasting licenses, and related permits.

1.2 Demolition Work Plan

- The demolition plan shall, as a minimum, address the following:
 1. Safety Requirements.
 2. Precautionary measures for adjacent structures.
 3. Fire Protection.
 4. Dust Control.
 5. Transportation of Explosives.
 6. On-site Storage and Security of Explosives.
 7. Drilling Method.
 8. Handling and Placing of Explosives.
 9. Blasting Signals.
 10. Blasting Sequence.
 11. Post Demolition Survey.
- The following Explosive Safety Standards, as a minimum, shall be incorporated as part of the subcontractor work plan to be submitted:
 1. Occupational Safety and Health Administration (OSHA), Title 29 code of Federal Regulations (CFR) 1925.850-850, Subpart T, "Demolition."
 2. OSHA, Title 29 CFR 1926.900-914, Subpart U, "Blasting and the Use of Explosives."
 3. OSHA, Title 29 CFR 1910.109, "Explosives and Blasting Agents."

4. Standards relating to the use and transportation of explosives:
 - a. DOT, Title 49 CFR 177,848, "Segregation" of Hazardous Materials."
 - b. DOT, Title 49 CFR 100-199 and 397-19. (Packaging and Transportation).
- The subcontractor will provide as an appendix to their work plan engineering calculations substantiating the cuts, drilled hole dimensions, and types and size of charges to be used.

1.3 Seismic Monitoring Plan

- The subcontractor shall submit a seismic monitoring plan and, as a minimum, it shall include the following:
 1. A site plan or aerial photograph showing the layout of all residences within a 1,000 foot radius.
 2. Performance requirements.
 3. Monitoring equipment to be used and their locations.
 4. Noise/vibration allowances.
 5. Weather considerations.

1.4 Submittals Required

- The subcontractor shall be required to make the following submittals:
 1. Demolition Work Plan.
 2. Health and Safety Plan.
 3. Seismic Monitoring Plan.
 4. Personnel Qualifications. *
 5. Engineering Calculations.
 6. Explosive Handling, Transportation, and Storage Plan.